



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,773	11/25/2003	Daniel F. Handman	3586.1000-001	4185
21005	7590	05/16/2006		
HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133			EXAMINER GEISEL, KARA E	
			ART UNIT 2877	PAPER NUMBER

DATE MAILED: 05/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

23

Office Action Summary	Application No. 10/721,773	Applicant(s) HANDMAN ET AL.	
	Examiner Kara E. Geisel	Art Unit 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20,40 and 43-46 is/are allowed.
- 6) ☒ Claim(s) 1-10, 12, 14, 17, 21-30, 32, 34, 37, 41 and 42 is/are rejected.
- 7) ☒ Claim(s) 11, 13, 15, 16, 18, 19, 31, 33, 35, 36, 38 and 39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, see the amendment, filed February 21st, 2006, on page 14, with respect to the rejection(s) of claim(s) 1, 17, 21, 37, and 41-42 under 102(b) have been fully considered and are persuasive in that Tull (USPN 5,361,854) does not teach determining the twist of an object. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Thomas et al. (USPN 5,798,828).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 4-8, 12, 14, 17, 21-22, 24-28, 32, 34, 37, and 41-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Thomas et al. (USPN 5,798,828), newly cited.

In regards to claims 1, 21 and 41, Thomas discloses an apparatus and method for determining changes in the shape of an object (fig. 2), comprising an electromagnetic radiation source coupled to the object (13 and column 2, lines 56-58), the electromagnetic radiation source emitting a shaped beam (any laser beam inherently has a shape), and an array of electromagnetic radiation sensors coupled to the object to receive radiation from the radiation source (23, 27 and column 2, lines 64-67), responses of the sensors indicating angular orientation of the shaped beam with respect to the array (column 2, lines 35-51), and a processor processing the responses of the sensors to determine a twist of the object (column 2, lines 35-51 and column 4, lines 54-63; yaw and roll are different twist angles).

Art Unit: 2877

In regards to claims 2 and 22, the responses of the sensors indicate a displacement of the shaped beam with respect to the array (column 3, lines 12-26).

In regards to claims 4-6 and 24-26, the source is at least two laser diodes (column 4, lines 19-23).

In regards to claims 7 and 27, the processor further determines bend of the object (defined by the examiner as the pitch, or rotation about the X axis, column 2, lines 43-47).

In regards to claims 8 and 28, the sensors are in a non-linear position (fig. 2, 23, 25, 27, and 29 and they are 2D detectors as disclosed column 4, lines 26-40).

In regards to claims 12, 17, 32, 37 and 42, the apparatus and method further comprises a second radiation source (fig. 2, 15) coupled to the object, the second electromagnetic radiation source emitting a shaped beam (any laser beam inherently has a shape), and a second array of electromagnetic radiation sensors coupled to the object to receive radiation from the second radiation source (25, 29 and column 2, lines 64-67), responses of the sensors indicating orientation of the shaped beam with respect to the array (column 2, lines 35-51). Furthermore, the second source (15) is axially displaced along a length of the object with respect to the first radiation source (13), and the second array of sensors (25, 29) are axially displaced along a length of the object with respect to the first sensors (23, 27) to provide a combined indication of changes in the shape of the object.

In regards to claims 14 and 34, the beams are substantially co-directed (fig. 2, 17 and 19).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2877

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al. (USPN 5,798,828), newly cited, in view of Stirland et al. (USPN 3,723,013), previously cited.

In regards to claims 3 and 23, Thomas is silent to the beam having a substantially cross-shaped cross-section.

Stirland discloses an alignment system, which used a beam with a cross-shaped cross-section (figs. 3 and 11), to determine the relative position of the objects in question. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the cross-shaped beam of Stirland in the apparatus of Thomas in order to more accurately determine the position of the beam on the array of detectors.

Claims 9 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al. (USPN 5,798,828), newly cited, in view of Toshio (JP 60006811), previously cited.

In regards to claims 9 and 29, Thomas is silent to having a focusing device positioned between the source and the sensors.

Toshio discloses an apparatus for measuring the deflection of a beam to indicate distortion in an object (fig. 3). Toshio uses a lens (fig. 3, 10) to focus a light beam onto a sensor array. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the focusing device of Toshio's apparatus, in between the source and the sensors of Thomas' apparatus in

Art Unit: 2877

order to focus the beam more precisely on the sensors and to more accurately determine the position of the beam on the sensors, therefore more accurately determining the twist of the object.

Claims 10 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al. (USPN 5,798,828), newly cited, in view of Pund (USPN 5,592,285), previously cited.

In regards to claims 10 and 30, Thomas is silent to the wavelength range of the source.

Pund discloses a device for determining the relative position of a light source and a sensor, and teaches that a laser diode can be used as the light source (column 1, lines 50-52). Furthermore, it is disclosed that the optical radiation can be deep ultraviolet to long wavelength infrared (column 1, lines 9-13), which includes visible. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the source in Thomas' device emit light anywhere from the ultraviolet to the infrared, in order to use the device in a variety of applications and in a variety of environments.

Allowable Subject Matter

Claims 20, 40, 43-46 are allowed over the prior art of record for the reasons set forth in the previous office action (paper number 090205).

Claims 11, 13, 16, 18, 31, 33, 36, and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims for the reasons set forth in the previous office action (paper number 090205).

Claims 15, 19, 35, and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Art Unit: 2877

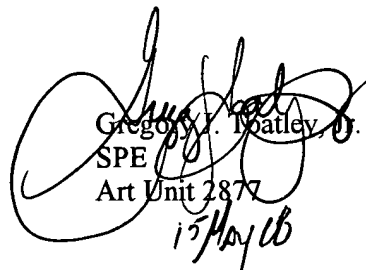
As to claims 15, 19, 35, and 39, the prior art of record, taken alone or in combination, fails to disclose or render obvious an apparatus or method for determining changes in the shape of an object wherein a first and second shaped beam is substantially counter-directed, in combination with the rest of the limitations of claims 15, 19, 35, and 39.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kara E Geisel whose telephone number is **571 272 2416**. The examiner can normally be reached on Monday through Friday, 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on **571 272 2800 ext. 77**. The fax phone number for the organization where this application or proceeding is assigned is **571 273 8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Gregory J. Toatley, Jr.
SPE
Art Unit 2877
15 May 06

K.G.
KEG
May 12, 2006